DOCUMENT RESUME

ED 407 791 EC 305 550

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TITLE	Learning Characteristics of Boys with Attention Deficit/Hyperactivity Disorder and/or Giftedness.
PUB DATE	Mar 97
NOTE	17p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 1997).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Achievement; *Academically Gifted; *Attention Deficit Disorders; Cognitive Style; Educational Strategies; Grade 4; *Individual Characteristics; Intermediate Grades; Interpersonal Competence; *Males; *Performance Factors
IDENTIFIERS	Academic Accommodations (Disabilities)

ABSTRACT

This study investigated the different characteristics of nine fourth-grade boys, three boys with attention deficit hyperactivity disorder (ADHD), three boys with giftedness, and three boys with ADHD and giftedness. Information reported by teachers, parents, and the children were analyzed using an embedded, multiple-case design, with constant comparative procedures within and across groups. The children's characteristics, academic performances, optimal learning conditions, and effective accommodations are evaluated. Results found: (1) giftedness did not offer protection from the negative outcomes associated with ADHD, including failing to produce relative to expectations or starting and staying with assignments; (2) giftedness did confer specific benefits related to talent (free reading, mental mathematics, social skills, memory, creativity) and to liking specific subject areas; and (3) strong preferences for social stimulation for students with ADHD (with and without giftedness) and a lack of knowing how to achieve social and participation goals. Thus, markers for students with ADHD were found to be preferences for group learning, dislike of most homework, difficulties following directions, and difficulties persisting and getting stared in routines and in long-term projects. Recommendations are made for academic accommodations for children with ADHD. (Contains 24 references.) (CR)

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ED 407 791

Zentall, S. S., Moon, S. M., Hall, A. M., & Grskovic, J. A. (1997, March). Learning characteristics of boys with attention deficit/hyperactivity disorder and/or giftednesss. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

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Abstract

The purpose of this study was to describe the characteristics of students with (a) attention deficit/hyperactivity disorder (AD/HD), (b) giftedness (GT), and (c) GT with AD/HD. We analyzed the information reported by teacher, parents, and children, using an embedded, multiple-case design, with constant comparative procedures within and across groups. We summarized their characteristics, academic performances, optimal learning conditions, and effective accommodations. Additionally, we addressed several a priori questions, and concluded that giftedness conferred benefits related to specific talents but did not offer protection from the negative outcomes of AD/HD. Differentiating markers of AD/HD were a preference for group learning in combination with a dislike of homework and of most subject areas and difficulties with following directions and with starting and staying with assignments. On the positive side for students with AD/HD (with and without GT), were (a) strong motivational preferences for participation but typically a lack of knowing how to achieve social goals, and (b) visual arts and creative talents.

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Learning Characteristics of Boys
with Attention Deficit/Hyperactivity Disorder (AD/HD) and/or Giftednesss

Over half the children with Attention Deficit/Hyperactivity Disorder (AD/HD), who are taught in regular classrooms, experience school failure or fail at least one grade by adolescence (Barkley et al., 1990; Brown & Borden, 1986), and over one-third fail to finish high school (Weiss & Hechtman, 1986). Intelligence is considered a protective factor in the long term outcome of AD/HD (Barkley, 1990, p. 213) and could moderate classroom outcomes. High intelligence (giftedness) might provide long term benefits by allowing children with AD/HD to channel activity constructively, to focus attention within talent domains, and to withhold responding until setting conditions are appropriate. Alternatively, high intelligence might allow these children only to compensate sufficiently to look average. Even less optimistically, intelligence could contribute to even greater expectations for children, who are already failing to meet some of their every day school requirements.

When we proposed to study the co-occurrence of AD/HD and giftedness (GT), unfortunately, there were no previous data that could inform us on the overlap and distinctiveness of these populations. There was literature reporting the learning characteristics of students with pure AD/HD (for review see, Zentall, 1993) and pure GT (Maker & Nielson, 1996; Van Tassel-Baska, 1994). In this literature, exceptionality was represented by a description of differences between groups of students with and without exceptionalities. Such a normative approach has allowed us to determine the characteristic behavior and performance of children for the purposes of identification and prediction. However, we have neglected to examine how differences are understood by the children and their important social partners (parents, teachers). This latter idiographic approach may be more helpful to understand children with co-occurring exceptionalities, especially where the interaction of divergent abilities/disabilities is of interest.

To develop a framework for understanding students with these exceptionalities, we used both the optimal stimulation theory (e.g., Berlyne, 1960) and Dabrowski's Theory of Positive Disintegration (1964). The optimal stimulation theory (OST) states that all organisms have a biological need for stimulation, which is homeostatically regulated by the individual through activity. Our prior work with students with AD/HD, carried out over several decades, found that these students were more readily understimulated (i.e., they satiated to stimuli faster) than children without AD/HD, especially in familiar school contexts, during the performance of rote, long, or repetitive tasks, and in settings that involved wait (for review see Zentall, 1975; Zentall & Zentall, 1983). Under reduced stimulus conditions, they were more likely to exhibit (a) sensation-seeking verbal and motor activity, (b) difficulty delaying motor and verbal responding (impulsivity), and (c) attraction to salient, novel stimulation in their internal and external environments (poor sustained and selective attention) (for review, see Zentall, 1993; 1995).

When we applied the optimal stimulation theory to students with AD/HD, we also broadened the number of ways that these students appeared to generate stimulation (i.e., attraction to cognitive, sensory, social, and emotional stimulation). Specific preferences for modality and type of stimuli have always been considered an individual factor. Dabrowski (1964) theorized that individuals were sensitive to and expressive with certain types and combinations of stimulation, such as intellectual, psychomotor, imaginational, emotional, and/or sensory stimulation. For this reason, we considered the possibility that there may be some basis to predict these preferences.

In this study, we speculated that children with pure AD/HD might rely on kinesthetic and sensory types of stimulation in the classroom; whereas children with both GT and AD/HD might additionally rely on intellectual or imaginal (creative) means to create stimulation--depending upon their specific talent domain (Gardner, 1983). Thus, the purpose of this study was to record the characteristics of students with and without AD/HD, GT, and combined AD/HD and GT, as reported by three different participant sources --teachers, parents, and the children. In addition to making comparisons within and across groups, we also examined specific a priori questions related to the role of intelligence in AD/HD and to whether accurate differentiation could be made between students with AD/HD and students with GT.

Method

Participants

Nine families and teachers of second through fourth grade students participated in this study. The nine boys were enrolled in a single midwestern school district and living with at least one biological parent. There were three families in each of three groups.

AD/HD. Three boys were identified by a school-based identification procedure that involved an initial referral by a community physician or psychologist. Criterion scoring for this group was established for teachers on the Conners Teacher Rating Scale-Revised (CTRS-R; 28-item, Goyette, Conners, & Ulrich, 1978) as 1.5 SD above the mean. Convergence was examined using the 48 item Conners Parent Rating Scale-Revised (CPRS-R, Conners, 1989).

GT. Three boys were identified by a school-based, multiple criteria identification procedure, with scores two SD above the mean on a group test, Cognitive Skills Index (CSI; Comprehensive Tests of Basic Skills / Fourth Edition, published by CTB/McGraw Hill, 1986).

AD/HD and GT. Three boys were identified by the same methods reported above, with the exception of one child, whose parents did not complete the CPRS. Therefore, the identification for that child was based on the initial referral, school records, and interview comments.

The three children in the AD/HD only group were in three different general education classes in that school district, whereas the six children identified with GT were enrolled in five full-time self-contained classrooms for children with GT. All six of the children identified with AD/HD were taking medication at the time of the study. Demographic data are presented in Table 1.

Design

A comparative, three-group, embedded, multiple-case study design was used (Moon & Trepper, 1996; Yin, 1989), because multiple case research is useful when the area of investigation is new, the issues are complex, and the number of cases available for investigation is too small for the application of multivariate statistics (Yin, 1993).

Measures

The primary unit of analysis was the child, matched to his parents and current teacher. Quantitative and qualitative data were collected from these nine students, their teachers, their mothers, and in two-parent households, their fathers, using semi-structured interviews, school records, and several standardized scales. Data were collected by a team of research assistants under the supervision of two senior researchers, one of whom specializes in research on AD/HD (first author) and the other of whom specializes in research on giftedness (second author). One member of the research team conducted a 30-45 min interview/assessment session with the parent(s) and a follow-up interview with the child of about 20-25 min. Sample questions for the students involved preferences about their own learning and perceptions of their family, friends, and school experiences. Parallel interview forms were constructed for parents and teachers. Parents were asked to fill out the Home Situations Questionnaire-Revised (HSQ-R, Barkley, 1987). The HSQ-R provides a rating of behavioral problems in home and public situations.

Teachers also participated in 30 min semi-structured interviews after or before school hours and completed the eight item School Situations Questionnaire (SSQ; Barkley, 1987). The SSQ-R provides information about school situations where children experience behavioral problems.

Data Analysis

Interviews were transcribed; rating scales were hand scored. For the standardized measures, raw scores were converted to *z* scores to facilitate comparisons to norms. All sources of data were analyzed using constant comparative procedures (Strauss & Corbin, 1990). After the three case analyses had been conducted for a given group, a within-group cross-case analysis was conducted. When all within-group analyses were completed, a cross-case comparison was conducted, which included a constant comparison with the learning characteristics reported in the literature for students with AD/HD and/or GT. At all stages of the analyses (individual, within group, and across group), peer debriefings (Lincoln & Guba, 1985), theoretical memos (Strauss, 1990), pattern matching (Yin, 1989), and data displays (Miles & Huberman, 1994) were used to refine the analyses.

Results and Discussion

The purpose of this study was to record the characteristics of students with exceptionalities during the performance of specific tasks in typical homework and academic settings, as reported by different participant sources --teachers (t), mothers (m), stepmother (m^s), fathers (f), and the children (c). In addition to making comparisons within and across groups, we also examined specific a priori questions related to the role of intelligence in AD/HD and to whether accurate differentiation could be made between students with AD/HD and students with GT. The following section is set up to first address characteristics and then to address questions related to the role of intelligence: (a) in compensating for the attentional and behavioral problems of students with AD/HD versus creating additional expectations for them, (b) in types of stimulation preferred, and (c) in differentiating among disorders.

Attributes of Intelligence

There were differences between children with and without identified giftedness (GT) in IQ test scores recorded in their school records. Both GT groups were at the ceiling of the CSI. Students with AD/HD appeared to be average to slightly above average in group-assessed intelligence. Differences were also apparent between the GT groups with and without AD/HD. The mean OTIS scores of the combined GH group were higher than those in the GT group. Two of the students with GH were near or at the ceiling on the OTIS. This was not true of the pure GT group. Because there are data that indicate that students with AD/HD do not perform optimally on group administered tests (Zentall & Javorsky, 1995), we have tentatively concluded from these data that students with GH may need to have higher IQ scores than students with pure GT to be identified as GT in school settings. In other words, the behavioral manifestation of AD/HD may produces a negative attributional bias of students' abilities that keeps them from being identified as GT.

Attention-Related Characteristics

The number of complaints recorded from the interviews about attentional problems were twice as frequent for each AD/HD groups as for the group with pure GT. Additionally, there was cross-informant (parent and teacher) agreement reported for problems in the AD/HD groups, but there were no problems reported by two sources for any child in the pure GT group. Problems were related to (1) getting started, (2) sustaining work action (e.g., losing interest, not finishing, doing minimal work, failing to edit, complete homework, or do routines), and (3) off-task or inaccurate performance when planning or doing worksheets. For example, the teacher of a student in the combined AD/HD + GT group observed initial problems in getting started and later problems with his [GH-2's] span of attention, "Sometimes he's kinda late...[and it] takes him a long time to get with what we are doing and then he is all right for a while and then he just goes through spurts. His concentration span is very limited." Similarly, problems with not attending to, remembering, or following directions were also reported only for students with AD/HD (with and without GT). For example, this same teacher recounts that, "he does not listen to directions, he does not.....He reads them sometimes. I think he definitely has to see them."

Using the frequency of problems reported by at least one participant, as well as, information from the teachers' ratings on the Inattentive/Passive factor of the Conners Teacher Rating Scale, we placed the nine children on a continuum with respect to each other and to average attentional performance (see Table 2).

As seen in Table 2, one student (G-2), who was classified pure GT, fell into the severe attentional problem group along with several children in the combined GH group. We concluded from a number of sources of data, that G-2 could have been in the combined GH group. For example, his teacher described the attentional performance of G-2, "I would say misbehavior is inattention...not being able to get done what he needs to do, or attend to what he's supposed to do, or decide [if] it's important." This teacher further reflects on her own descriptions and says, "It makes me go hmmm....because [G-2] just carries so many characteristics that I would find in attention deficit." Later within the same interview, the teacher described the attention of this

student quite differently but consistent with the situational dependence of the behavior and performance of students with AD/HD: "As we get into the subjects, he's usually attentive to everything, and wants to participate, and is always volunteering information." However, without specific developmental information, we cannot discount the fact that the attentional difficulties manifested by this child were attributable to situational stress (a divorce and remarriage).

Disorganization. Disorganization also characterizes children with AD/HD (Zentall, Harper, & Stormont-Spurgin, 1995) and was spontaneously reported by a number of participants for students with AD/HD with and without GT. Disorganization was observed primarily at the beginning but also at the end of the day for these students. For both groups of students with AD/HD [GH-2t; H-2t, H-3t], getting to school early or late apparently set the stage for them, as stated by this teacher of H-3, "The day is going to start off poorly because he is coming in and doesn't have his homework or forgets things....he has a hard time monitoring the close of the day. [He won't say I'll] "sit here and think about what happened today, let me look at my assignment book see what I have to take home, see what my responsibilities are." Also, reported for both AD/HD groups were difficulties getting started or procrastinating on projects or other assignments [GH-1fmc; H-2t, H-3t]. For example, for G-2, who had characteristsics of AD/HD, the teacher stated, "[He] doesn't get started very well and it's reminding him to sit down and reminding him to get started...but if there was an assignment due, it's usually not done....and he sometimes feels bad about that....The end of the day it's remembering to put everything together and get going on his way."

From several teachers' and mothers' observations about disorganization, we learned that students who save too many objects or hold too much information may have difficulty with organizing this greater quantity of physical or mental stimuli. For example, for one child in the pure AD/HD group there was evidence of disorganization of objects. The teacher of H-2 said,

> But organization skills are--they're just; we just try something new all the time....Orderliness and that kind of [thing] is not important to him...His desk is a pig pen all the time; you know, we have to clean it about two times a week. He's a saver, he keeps, he throws nothing away. He can't find anything...and he assures me that his room is like this too. And I'm sure it is.

A teacher of the gifted concluded, perhaps, more accurately about the relationship between quantity and organization in relation to only one child in the GT group [G-2, with characteristics of AD/HD], "He's extremely bright and I'm just amazed about his capacity to know things....I really feel that [his] fuddiness is just because his mind is just so full of so much, and it's not untypical of someone who is bright to be unable to organize." Similarly, the mother of H-1 stated,"His mind can occupy several different areas at one time. I think that's why he goes in so many different directions."

Effective accommodations for inattention. Parental communication and having parents check and remind students was observed by to be most useful for the AD/HD groups [H-2tm, H-3fc; GH-1m, GH-2m]. Parent/teacher monitoring appeared to work better than any organizational system, at least at this age, as stated by the teacher of G-2 with characteristics of AD/HD, "If I could find a system to help himorganize himself--that could stick, because he needs to know where things are and what he has done and what he hasn't done."

In addition to monitoring assignments, theteacher of H-2 was aware of the importance of monitoring the comprehension of directions, "One of the biggest things with him that I've found does help is, it helps me understand what he's not understanding, or if my directions aren't clear....After I've given directions, that often times I'll walk to him--now, you explain to me, what do you think you should do here."

Ineffective consequences. Teachers and mothers also reported a number of activities that didn't work, especially for the children with GH. For example, this teacher of GH-2 stated, "I tried having him at the beginning of the year stay after school one day to get caught up on work, but that turned into a negative." This mother of H-2 reflected on similar experiences other son in general education settings, "Sometimes he has a hard time

staying on task and getting his school work done. So the teacher..kept him in at recess. And that didn't seem to really do any...it didn't help him to do it."

Not only did keeping these children after school prove ineffective, but they often made the situation worse, as stated by the teacher of GH-3, "He generally makes up excuses for why he hasn't done this. And its an endless battle between the two of us. He misses recess. He misses lunch recess." Parents similarly recognized that these techniques could make a bad situation worse, as stated by this father of GH-2, "Like one day I asked him to clean his room, this beautiful sunny day, and he didn't. So he stayed in that room until he finished. He never did; missed the sunny day, and the room was twice as messy as when he started." The ineffectiveness of these techniques may be related to the fact that the children's behavior functioned to avoid tasks that were not meaningful, and for students with GH tasks can be nonmeaningful on two fronts.

Parents of GH students were even more critical of teachers who punished their children for their abilities (e.g., need for challenging tasks) and disability-related behavior (e.g., inattention). As stated by this father of GH-2, "Second-grade was a disaster. The teacher was not very flexible at all. She decided that if he could not do the work that was very easy, that he would never be able to do the work that was hard. Now that was her philosophy and he got no where, so we switched schools after that." This was stated differently by the mother of GH-3,

> When he was in first grade he was in trouble a lot. Oh gosh, he was always standing on line....That's their discipline. They don't get to play at recess. They stand on a line. He was bringing notes home on a daily basis that he was not listening. He was not paying attention. And when I'd talk with him about it he'd say, 'Mom, if I'm not paying attention, if I'm not listening, how did I get all the answers right?' Which I thought was very logical for a 6 year old. And I was upset that they were sending these notes home....They were pictures: happy face, straight line, sad face circled with his behavior...and he had to carry those home daily. It was terrible for his self-esteem.

Even the student, GH-1, could make judgments about the unreasonableness of losing recess for some types of behavior, "Miss H. had more reasons to loose recess with than Miss D...and I wasn't having much recess....With running in the halls that would lose me my recess. Miss D. doesn't have that rule. [Her rules are] NO fighting and stuff."

Academic Performance

Commonalities for all three groups of students at this age were reported difficulties with lower level skills. There were difficulties reported for worksheets and for routine tasks and activities by students with AD/HD [H-1c, H-2mt], with combined GH [GH-3t], and with pure GT [G-1c, G-2tc, G-3m], especially if tasks were long or with a time pressure [G-2t, with characteristics of AD/HD]. For the students with AD/HD (with and without GT), additional underachievement was described, " He's [H-2] certainly an average student -- maybe a little bit above average. Definitely I think he has more capabilities, you know, than his work reveals." "His [GH-2t] test scores show, I mean, he's a very smart child, but as far as his school work, no. No, no not at all. He is a classic example of an underachiever."

Handwriting. At this age all students were learning to write, and slowing down for repeated practice may have been difficult for all three groups [AD/HD: H-1m, H-2t, H-3t; GH: GH-1tm, GH-2t, GH-3t; & GT: G-1fmt, G-2t, G-3c]. Poorer visual-motor test performance and handwriting have been well-documented for students with AD/HD (for review see, Zentall, 1993). For students with GT, written communication may constrict and slow down their thinking, as stated by this teacher of G-1, "[He] absolutely detests handwriting."

However, for students with pure GT, there was not the perception of the physical difficulty or laborousness of the task, which was specifically described by each teacher of students with GH (GH-1, GH-2, GH-3], for example, "Writing..physically writing, I think, is difficult....[for GH-1]." For students with pure AD/HD the laborousness of handwriting was also noted by each general educator, but poor handwriting was

consistently attributed to working carelessly and too fast, as stated by this teacher of H-3, "but to have to write it down would be difficult for him. He has pretty poor penmanship and he's pretty quick and does things too fast....He thinks faster than he writes, makes it difficult."

Reading. Students with AD/HD (with and without GT) had specific complaints about some reading activities. For GT alone [G-1cm] there were specific circumstances that made reading a problem (e.g., long, boring books), which were similar to the things that made reading difficult or distasteful for students with AD/HD, as stated by this teacher, "Reading from a book on his [H-3] own is probably his worst. If you ask him to read a paragraph and answer comprehension questions from it, eh that's boring." Teachers and parents also reported that children from both groups with AD/HD had difficulty getting started on reading assignments--although once started they might proceed well [GH-1tf, GH-2f, H-1m].

For students with GH, there were no reports of being a poor reader. The closest statement to that effect was made by the teacher of GH-1, "He's also a slower reader, though a very good reader. He's slow, so that a reading assignment might take longer for him." On the other hand, teachers of students with pure AD/HD described specific skill deficits in phonics and word attack, "Reading is not, not real easy for him [H-2t] though. He has some difficulty with word attack skills."

In contrast to these complaints about certain reading tasks and skill deficiencies that made learning difficult, an equivalent number of participants reported that reading made learning fun, especially for the combined group [GH-1c, GH-2t, GH-3tm; and for G-2ct, with characteristics of GH] but also in the AD/HD group [H-2cm, H-3c].

English and language arts. These areas were difficult for several children in the AD/HD groups (ADHD: H-2c,H-3m; and GH: GH-2c), perhaps because of the reading or writing requirements. In the GT group, one child had less skill in the creative writing requirements of that subject area [G-1ct].

Planning and redoing work (editing) are the metacognitive subtasks of written work. These were also observed by at least one teacher to be deficient for H-2, "In terms of writing stories or, paragraphs and so forth for language, he doesn't want to do any of the...steps we go through with the preplanning. He never wants to edit. He never sees the importance of editing."

Social studies. This area was difficult for at least one child in all three groups [H-3f, GH-2fc, and G-3c], which again could be attributed to difficulties with reading or written work. However, children across groups [H-1m, H-2c; GH-3m; G-2m$_s$ with characteristics of GH] were also observed to like social studies or history. These reports were related to studying specific content areas (explorers or Native Americans) and to learning new and different things.

Science. For all the groups, the major academic preference was science, with learning made more easy when it involved science projects, activities, experiments, and use of study guides and high interest content, such as space or science fiction [H-1ftmc, H-2mc, H-3c; GH-1t, GH-2ct, GH-3c; G-1cmf; G-2t; G-3cm]. The educator of GH-1 described how much liking an academic area depended on the learning activities used, "Science, if it's an activity--sometimes is good; it depends on how much he has attended to what the direction is....Is it animated...that would do it for him." Problems in science, were reported only for the children with pure AD/HD [H-2c, H-3mf] and appeared to be due to the requirements of waiting, working independently, or reading from textbooks.

Math. Math was not reported by any participant in the pure GT group as making school difficult, and for one student, math problem solving made learning fun [G-1cfmt]. For the groups with AD/HD the data pattern was more difficult to discern. For children in the pure AD/HD group, there were reports about math both pro [H-1m,H-2tmc, H-3mfc] and con [H-1c, H-2ct, H-3c], and in the co-occurring GH group, math was also seen as making school easy [GH-2f, G-2c, with characteristics of AD/HD] and difficult [GH-1mt, GH-2tc, GH-3tc], for example when the teacher mixed up math problem types.

Generally, it did not appear to be as much the content area as the way the subject was presented. Perhaps this explains some of the pros and cons reported for a subject area. For example, one teacher described a bad day as one in which, "He [GH-3] had to sit in his seat all day and was asked to do worksheet after worksheet. Math problem after math problem." Others also described assignments that were too long or too easy. The teacher of GH-3 provided insight into the nature of his difficulties, "He's really poor at math. And the reason that he struggles so is...that he hasn't memorized or doesn't know his multiplication or division facts. He's to the point now where reducing fractions to the lowest terms and those kinds of activities where he needs to apply his facts and he doesn't have it and can't do it."

Academic summary. Overall, there was consensus reported by and for students with GT and AD/HD that handwriting was not preferred and that science was highly preferred. There were specific skill deficits for students with AD/HD using word attack skills in reading and in the area of math with memorizing facts and with working mixed problems. The variability reported for the other academic areas appeared to be due to preferences for specific learning activities (e.g., experiments, projects) and topics (e.g., space, science fiction, explorers, Native Americans) and difficulty with other activities (e.g., waiting, worksheets, working independently, reading from textbooks or from long boring books). The lack of problems reported for science for either group with GT could be attributed to the way science was presented in the GT classrooms. However, the lack of problems reported for math for just the pure GT group, would be due to strengths in this area, rather than to classroom differences.

Accommodations for academics. Helpful accommodations reported for all three groups of students at this age were teachers who gave students individual attention and took a personal interest in them. Providing computers or allowing the child to dictate was an accommodation observed across groups [H-1m; GH-1t, GH-2t, GH-3c; G-1mft] but primarily by teachers of the gifted. For example, a teacher of G-1 said,"to ease the handwriting thing I allow him to type on the computer. You know...to get to his creativity, he has to pass this first block of this hatred of handwriting. So I allow him to type a lot of things."

Teachers also reported accommodations related to increasing structure, such as breaking down or writing assignment steps [H-2t; GH-1t, GH-2tm, GH-3t; G-2t, G-3t], checking assignments [H-2t; GH-1t, GH-2f; G-3m], and using additional examples or cues (charts, answer sheets, sample problems) [H-2t, H-3t; GH-3tc; G-2t, G-3c]. Helpful structure for students with AD/HD was related to being active and knowing what to do. For example, the educator of H-2 said,

> We do several things where we work in pairs or small groups. And he has trouble with that when the structure is not quite as, you know... it kind of depends on the partner....The other day when we did a social studies activity, an assembly line kind of a thing. I was kind of surprised, because he worked very well with that... And they just basically assigned the different tasks that this project involved. He had no problem with that at all...he understood exactly what this person wanted him to do....And he did it quite well.

For another student with AD/HD, accommodations were allowing him to assume helper or leadership roles, as stated by the educator of H-3, "[He works] better in a group that he's in charge of, not a group where somebody else is the leader....[I] give him those opportunities to help other people to be the highlight.....Give him a lot of that attention but in a positive way....but also there are times when I give [him] something to do or appear to help [and] he is wonderful."

Students with GT (with and without AD/HD) were provided with accommodations that were often cognitive, such as encouraging questions, getting the child to think or outline, and providing possible schedules and choices of challenging topics, reporting methods, and response modes. Also for G-1, the teacher said, "Like right now we are doing an independent study and the first thing we did was hand out a schedule to show them how it could be broken down over a four week period....So he realizes that he needs to use his time in school to the best of his ability--so he doesn't have...homework." Only for students with AD/HD (with and without GT) was a reduction of assignment length used [H-1mc; GH-2t] and a change in the work environment (i.e., letting the child work at the teacher's desk or at a private desk) [H-1mc, H-2mt; GH-2t; G-2t]. And more frequently

reported for the combined group than for either of the other two pure groups were behavioral management techniques using incentives of preferred activities--work first and then choir [GH-2f, GH-3t], gym [GH-2f, GH-3t], more recess [GH-2c], sharing time [GH-1t], or soda pop, movies, and parties [GH-3c].

Talent areas. We documented divergent profiles of specific academic and creative talents for both the GT and GH groups (see Table 3). All three students with GH were described as good readers, as loving to read, and as having vivid imaginations (even though GH-3 had some specific reading problems and GH-2 was described as an underachiever). As stated by the mother of GH-3, "He reads. He'll read for hours." Only one of the students with pure GT was described as a high reader (G-2, who was also the child with characteritistics of GH). Only children in the GT or GH groups had domain specific talent in math; G-3 had similar talent in science.

Creativity was defined generally as humor, imaginative games, and putting things together in novel ways. Creativity was observed somewhat more frequently in students with GH than in students with pure GT. For example, GH-1 and GH-2 had dramatic talent and were described as funny or having a good sense of humor; GH-3 had talent in the area of constume design. All three of the students in the GT group had evidence of creativity. G-2 and G-3 both loved fantasy and were imaginative. G-2 seemed the most talented in the verbal area--he loved reading, poetry, and telling stories; G-3 was most talented in dramatics and was the only one of the three with artistic talent. G-1 was the least creative--the evidence of creativity for this child was problem solving, a sense of humor, and he played the piano.

Dramatic talent was exceptional only in students with GT or GH. It was demonstrated by these boys in the creation of dramatic scenerios, which were played out indirectly with figures or directly through role-playing (e.g., as secrete service agents). Visual art talent was present more often for students with GH and H than for students with pure GT. All three of the students with GH loved to draw and to make things (e.g., to build, carve, make costumes and paper sculptures). Except for the evidence that GH-1 could put ideas together exceptionally well (language arts) and could do mathematics in his head and GH-3 had a large knowledge base, the students with GH seemed to shine more in the creative areas than the academic areas.

Finally, we concluded from the transcript data that the group intelligence test scores may have underrepresented the talents of students with pure AD/HD. Although they were not as talented as the GT or GH groups, there were scattered signs of moderate to high levels of talent in all three. Specifically, H-1 had a profile that was similar to that of our GH participants (i.e., high levels of imagination and visual spatial talent). Differences from the GT group were that he did not love to read. Both H-2 and H-3 were having problems with reading but were described as loving to draw in the visual arts area, and H-3 was described as a computer whiz.

Learning activities preferred. The single most often selected activity across all groups was computers [H-2t, H-3m; GH-1t, GH-3t; G-2t; G-1tfm], as stated by the teacher of H-2, "He loves the computer. He loves to do that." There also were cross-group preferences for other hands-on types of activities, such as drawing, building, art projects [H-2m, H-3tm; GH-1t, GH-2t, GH-3tm; G-1f, G-3c] and games [H-1m, H-2t, H-3m; GH-3cm; G-1fmc, G-2ctm$_s$], generally stated by the teacher of GH-3, "He naturally likes to do hand-on activities." One teacher observed that books did not provide a good learning opportunity for H-3, "His best way to learn is by reteaching it to somebody else...He won't pick up a book and read. I see him drawing, building."

Active participation outdoors and verbally in class were also highly preferred [H-2t, H-3t; GH-1t, G-1fm, G-2t, G-3c]. Two of the three children in the pure AD/HD group were aware of their preferences for activities they could self-correct. Types of reporting methods preferred were verbal responding, performing, or enacting plays and fantasies [H-1m, H-2t; GH-1t, GH-2c, GH-3m; G-2t, G-3c].

Behavior During Nonacademic School and Home Settings

Specials. Problems with specials were reported by teachers only for the pure AD/HD group. Problems in this area are consistent with other research on teacher reports (Zentall &

Stormont-Spurgin, 1995). One teacher described H-2 this way, "It was at the end of gym and um, we were getting ready to get lined up and...he was coming in across the gym and he just came sliding across the floor. That wasn't weird in itself at all....you know, he'll just shake his head and his hair will be flying all over and making goofy sounds, and everybody's looking at him. But it's just like, ha, I've got the release." "[In specials H-3 doesn't do] as well as he does in the regular classroom. He's been sent to the office a lot. I'm not really sure what for, but we have a 45 minute art period and he is probably in the office 50% of that time." The lack of difficulty in specials for students with GH may be due to their better ability to handle less supervised situations.

Homework. Only students with AD/HD [H-1c, H-2tc, H-3tmc] and GH [GH-1tc, GH-3t] had difficulties with homework (especially " a pile of homework") and long term projects, which often require homework [H-1m, H-2m ; GH-1mtc, GH-2f]. The students in the GH group were described by their teachers as either not doing the homework, "He [GH-3] doesn't do homework. He's very irresponsible" or as working hard at school to avoid taking it home, "He [GH-1] absolutely hates homework, so he works very hard at not having homework." GH-1 student spoke about how overwhelmed he felt when he had too much homework, "This uncanny homework. It's just usually I do not get my work done, because it is like two pages on paper. I usually end up bringing things home for homework. In September the homework was taken over on me."

The teacher of GH-1 noted greater homework problems, "especially when he was not taking Ritalin. I would try to check [his homework], because he'd simply dash out the door without thinking about anything. So a verbal check was often helpful. And when off medication, he did miss assignments. He just wouldn't take it home, or wouldn't think about it, or he'd lose it,...and his grade suffered because of that." But when he was on medication "he was almost fastidious about making sure things were done. And then he was very tense and stressed...he would burst into tears cause it was all just too much. So that stress level wasn't good."

Accommodations for homework. The children reported a number of useful homework accommodations: shorter assignments, writing for the child, asking the child to underline important things, telling them more about the directions, using tape recorders for directions, reminding them, having check points, and doing homework during commercials or MTV. Fathers reported giving the child attention, getting them started, and showing them how to figure things out. Mothers reported a wide variety of techniques (e.g., reading or writing for their children, giving them activity breaks between assignments, using incentives , choice, and discussions). These accommodations were based on careful observation of their children, as stated by the mother of H-1, "He can, however, be in the same room and you can be teaching him something, and he can be doing something else ...but he will know exactly what you're saying cause you can question him on it and he'll be able to give you the answers."

Mothers also reported communicating with the teacher (e.g., to get assignments cut down), and many teachers effectively used parental communication, as stated by the teacher of H-3, "I give homework just about every night, except Friday night, about 20 to 30 minutes of homework every night. I'd say out of four days he might not have his homework once or twice, but it'll come back the next day. I'll write a note in his assignment book and his parents will make sure it's in his bag."

When teachers failed to communicate to parents that a child might be having difficulty, a bad situation became worse according to a mother of GH-1,

> I felt like he was just a problem, and she [his teacher] just didn't want to deal with it. It was just like "do something about him!"....And it wasn't that I didn't try to talk with him and find out what his problems were. But I didn't even know there was a problem until the first grading period. And I went in to have the teacher conference, and she laid all this on me, and it was like, O.K., when did all this happen? "Well, it's been happening since the first of school." Well why didn't you say something to me before now? ....And after that I tried to stay in fairly constant contact with her....I don't think she was trying to help him. And if that's unfair to expect a teacher to do that, then I want to know what I'm

supposed to expect....And I'm not saying that the parent doesn't have any responsibility, because I think we do too. But I need that help.

The Role of Intelligence

We initially set out to answer several questions related to the role of high intelligence: (a) in compensating for the attentional and behavioral problems of children with AD/HD versus creating additional expectations for them, (b) in types of stimulation preferred, and (c) in differentiating among disorders.

Compensations/expectations. Even though there was some indication that the IQ of students with combined AD/HD and GT was higher than than of students with pure GT, overall benefits of intelligence did not emerge in the data analysis. However, specific talent areas did appear to be a moderating variable. For example as previously described, math was generally perceived to be a problem for students with AD/HD; yet a student with GH might have a talent area in mathematics. As stated by the teacher of GH-1: "he's so talented in many areas. I mean his mathematics he does completely in his head and so easily and so well." It is in these talent areas that giftedness may compensate for some of the attentional problems of AD/HD. Additionally, strong preferences for outside reading may confer specific benefits. Finally, we found that the social intelligence of GH-1was an important mediator of a teacher's response, "And he's delightfully funny. He's got a great sense of humor." These talent area(s) of students with GH appeared to have contributed to successful compensations for AD/HD, in the same way that academically weak areas (specific learning disabilities in reading) contribute to making for less successful classroom adaptations by students with AD/HD.

However, there was evidence that giftedness made some of the educational deficits of students with AD/HD more apparent--mainly for teachers. Parents of the combined group [GH-1m, GH-2f] observed that their children lost interest got excited and didn't think or talked "in the wrong direction." Teachers, on the other hand, reported discouragement in working with these children and described them as not being "good" students and as having poor "work ethics." For example,

> [GH-2] has had a lot of problems this year as far as getting things turned in on time, completing assignments...but his grades have suffered a great deal because he hasn't turned in anything. He appears to be very capable....He usually isn't in line when he is supposed to, not ready when he is supposed to be, he doesn't have the things he needs. I mean he never has the supplies he needs. Never can find a pencil, never can find a pen, never.

Not only were teachers more often critical of students in the combined groups, but these students appeared to be the only group [GH-1mc, GH-2c, GH-3c] able to articulate how these teachers were not performing up to expectation either. They assigned responsibility to teachers and substitute teachers who were boring, inflexible, or who gave assignments that were too repetitive or too much work per available time--even at this young grade level and even in classrooms for the GT. This was clearly stated by GH-3, "she hardly gave us any time to do our work and she gave us a lot of it." Again the G-2 child (with characteristics of GH) was the only other student who articulated similar instructional complaints, "she put hard assignments too early, and she wouldn't change it."

For the pure AD/HD group, specific teachers were identified as problems--substitute teachers, specials, and some general teachers. These teachers did not fail as instructional decision makers as much as they failed as behavioral managers (e.g., they punished or yelled because of the child's movement or they restricted movement, H-1mc, H-2c, H-3c).

Stimulation preferences. Unfortunately, all of our students identified with AD/HD were on stimulant medication, which made it difficult to determine their preferences for types of stimulation. However there was evidence of preferences for imaginative stimulation, as stated by the teacher of GH-1, who had insights into her student's natural imaginative preferences,

> But at times when he's not on medication I really have to watch him...it just takes a lot of keeping his attention to what he's doing and following the classroom. He has a whole imaginative thing going on inside his head, just play--I think there must be another world

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there that goes on cause you'll see him swooping his hand this way or that way and you know he's not with me, he's somewhere else.

We also find consistent evidence of preferences for social and participation stimulation in classroom learning contexts. Students with pure AD/HD especially, but also students with GH preferred group learning, even when they were aware that certain types of activities they might perform better alone, as stated by GH-1, "if I have to work by myself, if it's my fantasy story, it's okay." In contrast, the pure GT group generally preferred to work alone, unless there were many tasks that could be shared. These findings are consistent with the preference literature for working alone for the pure GT group (Baska, 1989) and for working with others for the AD/HD group (Zentall & Stormont-Spurgin, 1995).

Furthermore, their preferences for small group learning experiences often got students with GH into trouble (e.g., getting them overly excited and not thinking well or wanting to be a part of a group but becoming overly directive , social, or nontask-oriented). Teachers did not perceive students with GH [GH-1, GH-2] to be successful group participants, because they didn't carry their load in small groups and didn't contribute in large groups. Similar reports for students with pure AD/HD can be inferred from this statement by the teacher of H-2: "I think maybe ....when somebody does give him their full attention, he just goes crazy. You know, just, real, animated, squirrley sounds, and you know, they just kind of look at him kind of strangely."

Teachers often assumed that social attention was the child's goal, simply because the verbal and physical activity of these students received attention as a consequence. We hypothesized that it was equally possible that active participation was the desired goal. This is documented in the following teacher's descripton,

> [H-3] wants a lot of attention and he gets it negative or positive. The continuing problem I think is the talking out without raising his hand. A lot of times that's just because he's excited about what's going on or really wants to be called on. I think the biggest thing is he's a child in need of attention. He doesn't know what is an appropriate way to get it.....I'd say [he works well in] large groups if he's participating, but sometimes if he has his hand up and wants to participate and I'm calling on other children he'll get mad because I'm not calling on him.

In contrast to preferences of students with AD/HD for participating in large groups, were reports that the GH group participated insufficiently in large group discussions [GH-1m, GH-2t]. The nature of these differences is unclear.

Differentiating AD/HD from GT

Differentiating between students with pure GT and those with AD/HD (with and without GT) was made difficult by cross-group similarities in their strong preferences for active participation in classroom activities and their strong dislikes of other activities (e.g., routine tasks and lower level practice skills). For example, at this age all three groups had great difficulties with handwriting, yet it was observed to be physically laborious only for the two groups with AD/HD. Furthermore, at this age there were reports that all of these children did not finish some work and sometimes failed to remember things at the end of the day. However, not following directions and poor memory were only reported for the two groups of children with AD/HD. Sometimes poor memory was reported even by the children, as stated by H-2, "I was just trying to think. I just forgot. Comes through, stops, and then goes back out."

However, when there was GT present (with and without AD/HD), there were reports of liking specific academic subject areas, and there were no difficulties reported in science or in the specials (art/music/gym). More definitively, pure GT students were the only students with reports of a general liking of school [G-1fm, G-3c] and with preferences for working alone. There was additional evidence that challenge, pressure, competition, and the use of memory made learning easy and enjoyable. As well for this pure GT group, teachers did not report problems in their getting started on tasks, starting the day, working independently, on homework, or on math, which were typical for students with AD/HD (with and without GT).

Preferences for working with others that was reported by the children in both AD/HD groups further supported our conclusion that G-2 could have been identified with co-occurring AD/HD. That is, in addition to the frequent reports and ratings of attentional difficulties, this child

was the only one with greater preferences for group learning than was observed in the pure GT group, as described by his teacher, "Well it might be to sit down and do it by himself, but generally he would much rather do it with someone, so that they could discuss it." The fact that G-2 was never identified as a child with GH may be due to the fact that he had a good memory (but not for homework G-2t), a good sense of humor [G-2Ms], great ideas [G-2t], and attended well to those subject areas he wanted to participate in [G-2t]. However, as we previously stated, without specific developmental information, we cannot discount the fact that the attentional difficulties manifested by this child could be attributed to a divorce and remarriage that took place in the prior year.

Several summary statements can be made about differences and overlap among our groups. All three groups disliked lower level practice tasks, including handwriting. Students with GT liked school, especially when there was challenge. However, if that student had co-occurring GH, he reported liking only specific subject areas. In the AD/HD group, only H-1 reported liking a number of subject areas (e.g., science, social studies, language, art, and gym). Not only did this child have academic interests, but he also had verbal and creative talent. For these reasons, he may have been a "hidden" GH student. For students with GT, there were no problems reported working alone without supervision.

In contrast, students with AD/HD disliked homework, and were observed to have considerable difficulties with handwriting. There were also difficulties following directions, persisting and getting started in routines, in classroom readings, and in long term home or school projects. On the positive side, spatial and visual art talent were present for all of our AD/HD cases, which was not found for our GT cases.

Conclusion

Initially, we wished to describe what could be expected from these children in learning contexts, so that educators could be more effective. At that time we also raised several questions related to whether teachers and parents might have difficulty forming appropriate expectations for children with divergent abilities/disabilities and whether there might be specific benefits of intelligence in long term outcomes. Overall we concluded that GT did not offer protection from the negative outcomes associated with AD/HD of (a) failing to produce relative to expectations or (b) starting and staying with many assignments. The GT quality of the student did confer specific benefits related to talent (e.g., free reading, mental mathematics, social skills, memory, creativity) and of liking specific subject areas. Additionally, we documented in these data specific academic interests and imaginational talents for the children in the GH groups. Piechowki and Colangelo (1984) theorized that preferences for a combination of emotional, intellectual, and imaginational stimulation would have the greatest potential for positive outcome. Unfortunately, their emotional maturity may not be on the same level as their intellectual and imaginational, as observed by the mother of GH-1, "He's intellectually mature, but emotionally I'm not sure that he's there" and by the teacher of GH-2, "He's very capable . . . but emotionally--I worry about that a great deal."

The ability to articulate what general kinds of tasks and activities were not optimal may also be a benefit of the co-occurring GH group. Long term benefits for these children may be related to assertiveness and negotiation of individual needs in the classroom and home setting. More optimistically, all of these young children with AD/HD were able to articulate several optimal learning conditions. For example, H-1c was aware of the importance of increasing the specificity of directions; H-3c was aware that underlining important stuff helped; [GH-1c] preferred doing maps and posters with friends and writing fantasy stories alone; and GH-3c told us that he sits up front to hear better and his mother reported that he works better at school when he has a toy. We concluded that asking children questions such as "what makes learning easy (and difficulty) for you at school?" can be helpful in designing instruction for these children, even as young as second or third grade.

We also found strong preferences for social stimulation for students with AD/HD (with and without GT) and typically a lack of skill at this age for knowing what to do to achieve social and participation goals. Thus, markers for students with AD/HD were preferences for group learning, perhaps in combination with a dislike of most homework, difficulties following directions, and

difficulties persisting and getting started in routines and in long term projects. These differentiating markers may be important in light of evidence presented by Crammond (1994) on the similarity between creative GT students and students with AD/HD. In this study, we found evidence that the behavior of students with AD/HD could mask their talents (i.e., the profile of creative talents and academic interests of H-1, who was not identified as GT, and the higher IQ scores reported in classrooms for students with GT for the GH group than for the pure GT group).

For a student, such as H-1 and for all of the students in the GH group with creativity, we hypothesized that potential problems could be related to teachers failing to monitor the effects of psychostimulant medication on a child's creativity. In this study, a teacher of a GH student did monitor these effects, "When he was on Ritalin alone, it seemed to make him [depressed]...He had a lot of tears. Now he has gone on a new medication for depression, too. Now he has lots of friends. He tells jokes again. He's always singing or playing. And a lot of it is the creative, energetic side of him coming that's coming back."

We have drawn several other conclusions about the educational implications of our findings. Even though students in these three groups represent a minority in regular education, they present major behavioral management problems for the classroom teacher. In response to these problems, it is possible that these children could be micromanaged to fit within educational contexts. That is, educators might naturally exclude children with AD/HD from group situations, if their behavior became overly excited in those settings, rather than understanding the motivational potential of social stimulation and participation. Similarly, because these children have greater difficulty organizing their work and their time, they might be more likely to be given modifications of assignments that are prestructured, more rote/repetitive in nature, and that provide little opportunity for creativity, self-direction, or organization. Finally, management of their excessive activity and oppositional behavior could take the form of extensive training for low rate and compliant behavior, whereby students with AD/HD would miss needed opportunities for active participation.

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Table 1
Demographic Data

		IQ Test Scores		Behavioral Rating Scores			Age
Group	Case	OTIS	CSI	CTRS-R teachers'	CPRS-R mothers'	CPRS-R fathers'	Age in months
GT	G-1	133 (147)	134 (141)	-0.7	-0.3	-0.3	117
	G-2	130	131	1.3	-0.3	-0.7	105
	G-3	116[1]	141 (141)	1.7			108
		M = 126	M = 135	M = .8	M = -.3	M = -.5	M = 110
GT + AD/HD	GH-1	150	136	1.5	-0.3	1.0	100
	GH-2	143	141	1.1	3.1	3.1	114
	GH-3	137	134 (141)				115
		M = 143	M = 137	M = 1.3	M = 1.4	M = 2.1	M = 110
AD/HD	H-1		110		2.1		126
	H-2		109	-0.3	1.0	2.2	105
	H-3		90	1.9	2.2	1.8	102
			M = 103	M = .8	M = 1.8	M = 2.0	M = 111

Note. Scores bracketed are previously administered tests. Missing data are indicated by blank cells. Behavioral ratings of the AD/HD and GT + AD/HD groups were made while the children were taking psychostimulant medication.

Table 2
Ratings of Inattention

Very Low	Low	Average	High	Very High
		G-1, G-3		G-2
			GH-3	GH-1, GH-2
			H-1	H-2, H-3

Note. The gifted (G) group is listed on the top row, the combined (GH) group is listed in the second row, and the AD/HD (H) group is listed in the third row for readability purposes only.

Table 3
Reported Talent Areas and Interests

	Very Low	Low	Average	High	Very High
Reading			G-1	G-2	
				GH-1, -2, -3	
		H-2, -3			
Language Arts			G-1, -3	G-2	
			GH-2		GH-1
		H-2, -3		H-1	
Math				G-2	G-1
		GH-3	GH-2		GH-1
	H-1		H-2, -3		
Science				G-1, -2	G-3
				GH-1, -2	
			H-2, -3	H-1	
Spacial Mechanical				G-1, -2, -3	
				GH-1, -2, -3	
				H-1	
Visual Arts				G-3	
				GH-1, -2, -3	
			H-2, -3	H-1	
Drama				G-2	G-3
				GH-2	GH-1
Interpersonal		G-3		G-1, -2	
				GH-3	
Creativity			G-1		G-2, -3
				GH-2	GH-1, -3
				H-1	

Note. The gifted (G) group is listed on the top row, the combined (GH) group is listed in the second row, and the AD/HD (H) group is listed in the third row within each talent area for readability purposes only.